Dimosthenis Pasadakis

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ᛸ Scholar profile
R⁶ Dimosthenis-Pasadakis
Date of birth: July 29, 1991
Birthplace: Thessaloniki, Greece

Research focus

Development of efficient and accurate routines for the learning of large-scale graphs and the utilization of these graphical structures in partitioning and clustering tasks.

Current occupation

Since 09/2018	**Ph.D. candidate**, Università della Svizzera italiana (USI), Faculty of Informatics, Institute of Computing, Lugano, Switzerland. Supervisor: Olaf Schenk. *Estimated graduation date 01/2023*.

Education

10/2021 – 11/2021	**Research visit**, Huawei Technologies, Zürich Research Center, Switzerland.
2017–2018	**Research assistant**, Università della Svizzera italiana (USI). Tasks: *Numerical optimization and modelling techniques for power system planning and operations, including graph partitioning and multilevel approaches.*
2016–2017	**Student researcher**, Università della Svizzera italiana (USI). Tasks: *Mesh generation from CT scans, FSI simulations in the human heart.*
2015–2017	**Master of Science in Computational Science**, Università della Svizzera italiana (USI). Honors: *Magna cum laude*. MSc thesis: *A Three Dimensional Fluid-Structure Interaction Approach for the Simulation of the Human Heart Based on an Embedded Boundary Method.*
09/2013–02/2014	**Exchange program**, Technical University (TU) Berlin, Germany.
2009–2015	**Diploma of Physics**, Aristotle University of Thessaloniki (AUTH), Greece. Honors: *Very good*. Undergraduate thesis: *Post-Chernobyl ^{137}Cs in the atmosphere of Thessaloniki.*

Projects as member

04/2019 – 04.2023   Assisted in the writing of the project proposal *Balanced Graph Partition Refinement using the Graph p-Laplacian*, Grant number: 182673, founded by the Swiss National Science Foundation (SNF) for a 4-year duration. Dimensions link, SNSF link

Co-supervised student projects

2022   K. Szenes, *Spectral clustering using a multilevel approach*, Semesterarbeit, Computational Science and Engineering MSc programme, ETH Zürich.

2020   L. Najdenov, *A study of spectral clustering techniques for machine learning applications*, Bachelor's Thesis, Faculty of Informatics, USI Lugano.

2019   L. Karagyaur, V. Braglia, and L. Ferri, *A high performance video segmentation framework*, Semester project, MSc of Computational Science, USI Lugano.

2018   E. Barnett, S. Gyanchandani, and S. Rawat, *High performance topology optimization*, Semester project for the MSc of Computational Science, USI Lugano, and poster submission to the PASC'18 Conference, Basel, Switzerland.

Teaching experience as assistant

2020 – 2022   **High-Performance Computing Lab for CSE**, *Format: lab course & lectures, language: English, audience: Computational Science and Engineering (Bachelor). ETH Zürich.*
Content: HPC systems, parallel programming models, large-scale scientific simulations, performance analysis, parallelism detection, OpenMP, MPI, scientific mathematical libraries.

2018 – 2022   **Numerical Computing**, *Format: lab course & lectures, language: English, audience: Informatics (Bachelor). USI Lugano.*
Content: Graph clustering, graph partitioning, solving linear systems of equations, page rank algorithm and large-scale nonlinear optimization, real-world applications.

2019 – 2021   **High Performance Computing**, *Format: lab course & lectures, language: English, audience: Computational Science (Master). USI Lugano.*
Content: Numerical methods and HPC, large-scale scientific simulations, parallel programming models, HPC systems, graph partitioning, scientific mathematical libraries, C programming language, linear algebra, mathematical optimization, partial differential equations.

2020   **Linear Algebra**, *Format: lab course & lectures, language: English, audience: Informatics (Bachelor). USI Lugano.*
Content: Linear mappings, linear spaces, Gauss method, vector spaces, linear maps and matrices, determinants, eigenvectors and eigenvalues.

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<tr><td>━━━━━━</td><td>Software</td></tr>
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Since 2020 **SQUIC** ⚡, Part of the SQUIC team, estimating large-scale sparse precision matrices via a GLASSO optimization routine.

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<tr><td>━━━━━━</td><td>List of publications</td></tr>
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Note: Equal contribution is denoted by an asterisk (*).

Journal articles

○ D. Pasadakis, M. Bollhöfer, and O. Schenk, *Sparse quadratic approximation for graph learning*. TechRxiv, 2022, *Submitted to IEEE Transactions on Pattern Analysis and Machine Intelligence*. preprint

○ D. Pasadakis, C. L. Alappat, O. Schenk, and G. Wellein, *Multiway p-spectral graph cuts on Grassmann manifolds*, Machine Learning 111, 791–829, 2022. doi

○ A. Eftekhari*, D. Pasadakis*, M. Bollhöfer, S. Scheidegger, and O. Schenk, *Block-enhanced precision matrix estimation for large-scale datasets*, Journal of Computational Science, vol. 53, 2021. doi

Conference papers

○ T. Simpson, D. Pasadakis, D. Kourounis, K. Fujita, T. Yamaguchi, T. Ichimura, and O. Schenk, *Balanced graph partition refinement using the graph p-Laplacian*, in Proceedings of the Platform for Advanced Scientific Computing Conference, ser. PASC'18. New York, NY, USA: ACM, 2018. doi

Selected posters

○ D. Pasadakis, D. Kourounis, and O. Schenk, *Balanced graph partition refinement in the p-norm*, International Conference on Continuous Optimization (ICCOPT'19), 2019.

○ D. Pasadakis, D. Kourounis, and O. Schenk, *Spectral graph partitioning in the p-norm*, in Computational Science at Scale (CoSaS'18), 2018.

○ D. Pasadakis, M. Nestola, F. Maffessanti, B. Becsek, D. Obrist, R. Krause, *Fluid-structure interaction simulations of the heart*, in Platform for Advanced Scientific Computing Conference (PASC'17), 2017.

○ D. Pasadakis, D. Kourounis, and O. Schenk, *Estimation of drag and lift coefficients for steady state incompressible flow of a newtonian fluid on domains with periodic roughness*, in Platform for Advanced Scientific Computing Conference (PASC'16), 2016.

Conference & seminar talks

- (Upcoming) *Sparse quadratic approximation for graph learning*. 2022, June 29; Platform for Advanced Scientific Computing Conference (PASC'22), Congress Center Basel, Switzerland.

- *Multiway p-spectral graph cuts on Grassmann manifolds*. 2021, September 13; Swiss Numerics Day (SND'21), EPFL, Lausanne, Switzerland.

- *Multiway p-spectral clustering on Grassmann manifolds*. 2021, May 17; SIAM Conference on Applied Linear Algebra (LA'21), virtual event, New Orleans, USA.

- *Spectral graph partition refinement using the graph p-Laplacian*. 2019, August 08; International Conference on Continuous Optimization (IC-COPT'19), Technical University (TU), Berlin, Germany.

- *Improvement of graph partitions using the graph p-Laplacian*. 2018, July 3; Platform for Advanced Scientific Computing Conference (PASC'18), Congress Center Basel, Switzerland.

- *Balanced graph partition refinement using the graph p-Laplacian*. 2018, March 9; SIAM Conference on Parallel Processing for Scientific Computing (SIAM PP18), Waseda University, Tokyo, Japan.

- *Fluid-structure interaction simulations of the human heart*. 2017, September 28; Seminar Talk, ARTORG Center for Biomedical Engineering, University of Bern, Switzerland.

Outreach

- Our article *Multiway p-spectral graph cuts on Grassmann manifolds* featured in the December 2021 newsletter of the National Centre for High Performance Computing of the University of Erlangen (NHR@FAU). Newsletter link

Service

- Chair of ACM Papers Session 1B at the PASC'22 conference. Session link

Prizes & awards

- Best poster award. Category: Computer Science and Applied Mathematics. PASC'16, Lausanne, Switzerland.

- Best poster award, 3rd place runner-up. PASC'18, Basel, Switzerland.